CO-DIGESTION OF COMMERCIAL FOG & FOOD WASTE AT A MUNICIPAL WWTP

Paul Ebert
Des Moines Metropolitan Wastewater Reclamation Facility
Des Moines, Iowa
Des Moines WRF

- Serve a population of ~500,000
- Treat 60 MGD
- Generate ~40% of our own electricity
FOG Program

- WRA established FOG program in 2006
- 2000 FSEs in Des Moines Metro Area
- 800 grease interceptors
  - 1.2 million gallons of pretreatment capacity
  - Quarterly clean out estimate (25% rule):
    → 300,000+ gal of FOG & food solids
- 700 grease traps

Mainly food solids (75%)
Functioning Grease Interceptor

Inlet

4 - 5 ft.

Outlet

Water

FOG

SOLIDS
Grease Trap / Interceptor Waste Hauled to WRF

* FOG, food solids, & grey water combined
Out of the sewers

Into our digesters
Benefits of FOG Program

- Keeps FOG out of collection system
- Better for public & environmental health
  - Fewer sewer blockages, backups, & SSOs
  - Less time and $ spent on dealing with blockages
- Increased biogas production (via hauled waste)
- Uniform feedstock material
  - Heterogeneous chemical mixture; no single-type food wastes to cause upsets
- Generates revenue from hauled waste tipping fees
- Significantly reduced FOG disposal rates at digesters (benefit to waste generator)
  - Reduced rates subsidize the cost of trap / interceptor cleanouts
Turn Opportunity into Renewable Energy!

- Over 30 million tons of food waste sent to landfills annually
  - 18% of municipal waste
  - Difficult to timely capture methane at landfills
    - 2nd largest anthropogenic source of methane in the U.S.

- Food waste has 3x more methane potential than biosolids
  - 120 m³ gas/ton (biosolids) vs. 376 m³ gas/ton (food waste)

- EPA: If 50% of food waste was anaerobically digested, enough electricity could be generated to power over 2.5 million homes each year

- Des Moines WRF generates enough electricity to power over 1200 homes annually
  - 13,600,000 kWh generated in 2013
Issues We Deal With

• Waste Haulers
  • Training
  • Licensing
  • Management (scaling / transaction errors, etc.)

• Trash in interceptors
  • Likely bigger problem for food waste collection programs

• Pumpable / flowable waste
  • Foods scraps must be ground up
  • < ½ inch diameter

• Infrastructure maintenance
  • Scales, hauled waste tank, inorganic solids

(Example)
Trash in private yellow grease collection bin